Listing of Claims:

IN THE CLAIM

1. (Original) A wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein:

the wireless communication apparatus comprising:

correspondence determining means for determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels so that the correspondence is different for each transmission signal; and

extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels.

2. (Original) The wireless communication system according to claim 1, wherein:

the correspondence determining means comprises:

a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to produce first through K-th coded sequences, respectively, interleaved sequence producing means for interleaving the first through the K-th coded sequences to produce first through K-th interleaved sequences, respectively, partial transmission sequence producing means for dividing each of the first through the

K-th interleaved sequences into first through M-th partial transmission sequences, transmission signal producing means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively.

3. (Original) The wireless communication system according to claim 2, wherein:

the extracting and combining means comprises

a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas, demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel, demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first through K-th demodulated sequences, deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively, and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively.

4. (Original) The wireless communication system according to claim 3, wherein the transmitting portion comprises scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold.

5. (Original) The wireless communication system according to claim 4, wherein the scheduling means reduces the number of transmission sequences successively from the transmission sequence for which the reception quality at the receiving portion for each transmission sequence is low.

6. (Original) The wireless communication system according to claim 3, wherein the transmitting portion comprises:

scheduling means for reducing the number of frequency channels assigned to the transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of frequency channels assigned to the transmission sequences when the reception quality is higher than a predetermined second threshold.

7. (Original) The wireless communication system according to claim 3, wherein the transmitting portion comprises:

scheduling means for reducing the number of frequency channels assigned to the transmission sequence for which a reception quality at the receiving portion for each

transmission sequence is lower than a predetermined first threshold and for increasing the

number of frequency channels assigned to the transmission sequence for which the

reception quality is higher than a predetermined second threshold.

8. (Original) The wireless communication system according to claim 3, wherein the

transmitting portion comprises:

scheduling means for reducing the number of transmission antennas assigned to

the transmission sequences when a reception quality at the receiving portion is lower than

a predetermined first threshold and for increasing the number of transmission antennas

assigned to transmission sequences when the reception quality is higher than a

predetermined second threshold.

9. (Original) The wireless communication system according to claim 3, wherein the

transmitting portion comprises:

scheduling means for reducing the number of transmission antennas assigned to

the transmission sequence for which a reception quality at the receiving portion for each

transmission sequence is lower than a predetermined first threshold and for increasing the

number of transmission antennas assigned to the transmission sequence for which the

reception quality is higher than a predetermined second threshold.

10. (Currently Amended) The wireless communication system according to any one of

claim[[s]] 1 through 9, wherein OFDM (Orthogonal Frequency Division Multiplex) is

used as a wireless transmission method and frequency multiplexing is realized by

multiplexing subcarriers.

11. (Currently Amended) The wireless communication system according to ~~any one of~~ claim[[s]] 1 ~~through 9~~, wherein:

the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each transmission signal;

the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal in the transmission signal producing means.

12. (Original) The wireless communication system according to claim 11, wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i = 1, 2, ..., K) transmission sequence are completely orthogonal among the first through the M-th transmission signals.

13. (Original) A wireless communication apparatus having a plurality of transmission and reception antennas, comprising:

correspondence determining means for determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence

between first through K-th (K being an integer not smaller than 2) transmission

sequences and frequency channels so that the correspondence is different for each

transmission signal; and

extracting and combining means for extracting and combining, upon producing

first through K-th demodulated sequences, M demodulated signals corresponding to the

first through the K-th transmission sequences in accordance with the correspondence

between the first through the K-th transmission sequences and the frequency channels.

14. (Original) The wireless communication apparatus according to claim 13, wherein:

the correspondence determining means comprises:

a transmitting portion including coded sequence producing means for encoding

first through K-th transmission sequences to produce first through K-th coded sequences,

respectively, interleaved sequence producing means for interleaving the first through the

K-th coded sequences to produce first through K-th interleaved sequences, respectively,

partial transmission sequence producing means for dividing each of the first through the

K-th interleaved sequences into first through M-th partial transmission sequences,

transmission signal producing means for frequency-multiplexing the first through the M-

th partial transmission sequences corresponding to each of the first through the K-th

transmission sequences with respect to each of the first through the M-th partial

transmission sequences to produce first through M-th transmission signals, and first

through M-th transmission antennas for transmitting the first through the M-th

transmission signals, respectively.

15. (Original) The wireless communication apparatus according to claim 14, wherein:

the extracting and combining means comprises

a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas, demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel, demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first through K-th demodulated sequences, deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively, and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively.

16. (Original) The wireless communication system according to claim 3, wherein the transmitting portion comprises:

scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold.

17. (Original) The wireless communication apparatus according to claim 16, wherein:

the scheduling means reduces the number of transmission sequences successively from the transmission sequence for which the reception quality at the receiving portion for each transmission sequence is low.

18. (Original) The wireless communication apparatus according to claim 15, wherein the transmitting portion comprises:

scheduling means for reducing the number of frequency channels assigned to the transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of frequency channels assigned to the transmission sequences when the reception quality is higher than a predetermined second threshold.

19. (Original) The wireless communication apparatus according to claim 15, wherein the transmitting portion comprises:

scheduling means for reducing the number of frequency channels assigned to the transmission sequence for which a reception quality at the receiving portion for each transmission sequence is lower than a predetermined first threshold and for increasing the number of frequency channels assigned to the transmission sequence for which the reception quality is higher than a predetermined second threshold.

20. (Original) The wireless communication apparatus according to claim 15, wherein the transmitting portion comprises:

scheduling means for reducing the number of transmission antennas assigned to

the transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of transmission antennas assigned to transmission sequences when the reception quality is higher than a predetermined second threshold.

21. (Original) The wireless communication apparatus according to claim 15, wherein the transmitting portion comprises:

scheduling means for reducing the number of transmission antennas assigned to the transmission sequence for which a reception quality at the receiving portion for each transmission sequence is lower than a predetermined first threshold and for increasing the number of transmission antennas assigned to the transmission sequence for which the reception quality is higher than a predetermined second threshold.

22. (Currently Amended) The wireless communication apparatus according to ~~any one of~~ claim[[s]] 13 ~~through 21~~, wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers.

23. (Currently Amended) The wireless communication apparatus according to ~~any one of~~ claim[[s]] 13 ~~through 21~~, wherein:

the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency

hopping pattern for each transmission signal;

the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal in the transmission signal producing means.

24. (Original) The wireless communication apparatus according to claim 23, wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i = 1, 2, ..., K) transmission sequence are completely orthogonal among the first through the M-th transmission signals.

25. (Original) A resource assignment method for a wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein:

the wireless communication apparatus having the steps of:

determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels so that the correspondence is different for each transmission signal; and

extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the correspondence between the first through

the K-th transmission sequences and the frequency channels.

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26. (Original) The resource assignment method according to claim 25, wherein the step of
determining correspondence comprises the steps of:

encoding the first through the K-th transmission sequences to produce first
through K-th coded sequences;

interleaving the first through the K-th coded sequences to produce first through K-
th interleaved sequences;

dividing each of the first through the K-th interleaved sequences into first through
M-th partial transmission sequences;

frequency-multiplexing the first through the M-th partial transmission sequences
corresponding to the first through the K-th transmission sequences with respect to each of
the first through the M-th partial transmission sequences to produce the first through the
M-th transmission signals; and

transmitting the first through the M-th transmission signals.

27. (Original) The resource assignment method according to claim 26, wherein the step
of extracting and combining comprises the steps of:

receiving first through N-th (N being an integer not smaller than 1) reception
signals;

decomposing the first through the N-th reception signals into first through M-th
partial modulated signals for each frequency channel;

extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to produce the first through the K-th demodulated sequences;

deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively; and

decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences.

28. (Original) The resource assignment method according to claim 27, wherein the step of extracting and combining further comprises a scheduling step of reducing the number of transmission sequences when a reception quality at a receiver is lower than a predetermined first threshold and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold.

29. (Original) The resource assignment method according to claim 28, wherein the scheduling step reduces the number of transmission sequences successively from the transmission sequence for which the reception quality at the receiving portion for each transmission sequence is low.

30. (Original) The resource assignment method according to claim 27, wherein the step of determining correspondence further comprises a scheduling step of reducing the number of frequency channels assigned to each transmission sequence when a reception

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quality at the receiver is lower than a predetermined first threshold and of increasing the number of frequency channels assigned to each transmission sequence when the reception quality is higher than a predetermined second threshold.

31. (Original) The resource assignment method according to claim 27, wherein the step of determining correspondence further comprises a scheduling step of reducing the number of frequency channels assigned to the transmission sequence for which a reception quality at the receiver for each transmission sequence is lower than a predetermined first threshold and of increasing the number of frequency channels assigned to the transmission sequence for which the reception quality is higher than a predetermined second threshold.

32. (Original) The resource assignment method according to claim 27, wherein the step of determining correspondence further comprises a scheduling step of reducing the number of transmission antennas assigned to each transmission sequence when a reception quality at the receiving portion is lower than a predetermined first threshold and of increasing the number of transmission antennas assigned to each transmission sequence when the reception quality is higher than a predetermined second threshold.

33. (Original) The resource assignment method according to claim 27, wherein the step of determining correspondence further comprises a scheduling step of reducing the number of transmission antennas assigned to the transmission sequence for which a reception quality at the receiver for each transmission sequence is lower than a

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predetermined first threshold and for increasing the number of transmission antennas assigned to the transmission sequence for which the reception quality is higher than a predetermined second threshold.

34. (Currently Amended) The resource assignment method according to ~~any one of~~ claim[[s]] 25 ~~to 33~~, wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers.

35. (Currently Amended) The resource assignment method according to ~~any one of~~ claim[[s]] 25 ~~to 33~~, wherein:

the step of determining correspondence further comprises a step of determining, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each transmission signal;

the step of extracting and combining M demodulated signals extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal.

36. (Original) The resource assignment method according to claim 35, wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i = 1, 2, ..., K) transmission sequence are completely orthogonal among the first through the M-th

transmission signals.

37. (Original) A program of a resource assignment method for a wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, the program being for making a computer execute a process of determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels so that the correspondence is different for each transmission signal, and a process of extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels.

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